

### Electricity and Circuits

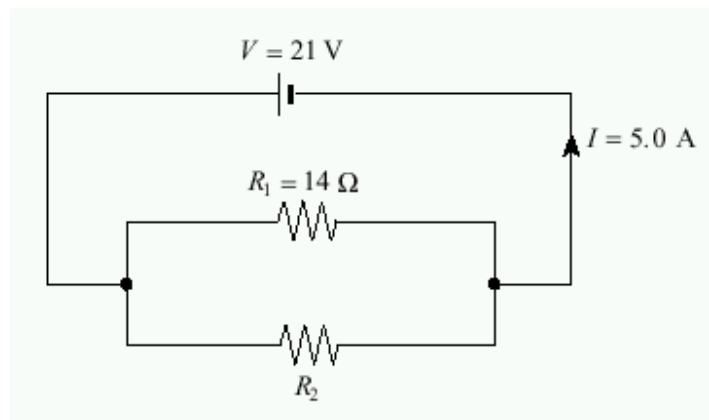
1. Which pair of values will cause the greatest deflection of an electron beam in a cathode ray tube?

	ACCELERATING VOLTAGE	DEFLECTION (PLATE) VOLTAGE
A.	400 V	20 V
B.	400 V	40 V
C.	800 V	20 V
D.	800 V	40 V

2. Electricity is transmitted at high potential to

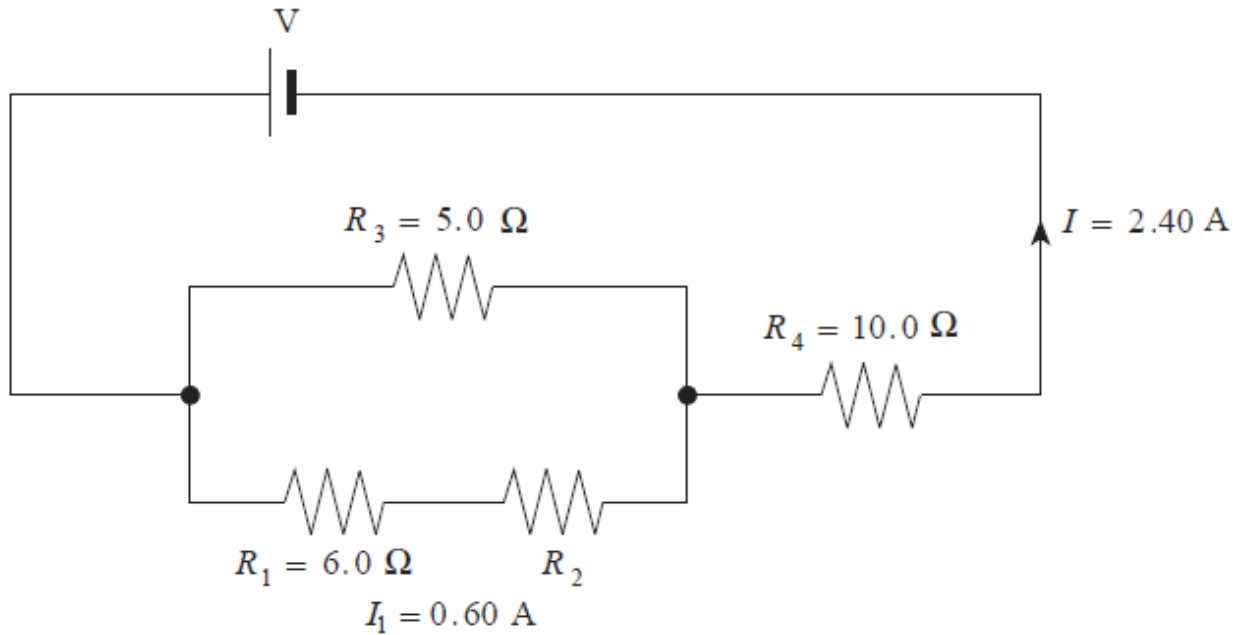
- A. Operate heavy equipment
- B. Maximize current in the transmission
- C. Minimize the energy lost as heat in the transmission lines
- D. Produce alternating currents because they always require high voltages

3. Find the current flowing through resistor  $R_2$  in the circuit shown below.



4. A cell has an internal resistance of  $0.50\ \Omega$ . It has a terminal voltage of  $1.4\text{ V}$  when connected to a  $5.0\ \Omega$  external resistance. What will its terminal voltage be if the  $5.0\ \Omega$  resistor is replaced by a  $10.0\ \Omega$  resistor?

5. A) Find the value of resistor  $R_2$

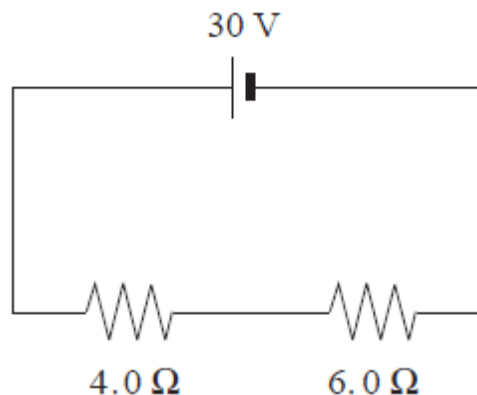


B) Find the potential difference of the power supply  $V$

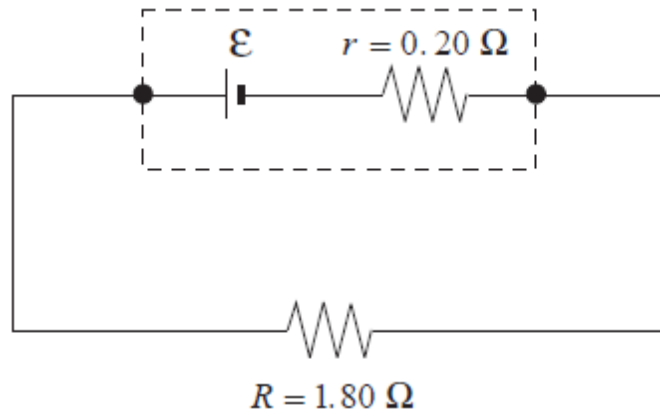
6. Which household electrical appliance consumes the least energy in a typical month?

- A. Stove
- B. Dryer
- C. Clock
- D. Refrigerator

7. What is the power output of the  $6.0\ \Omega$  resistor in the diagram?

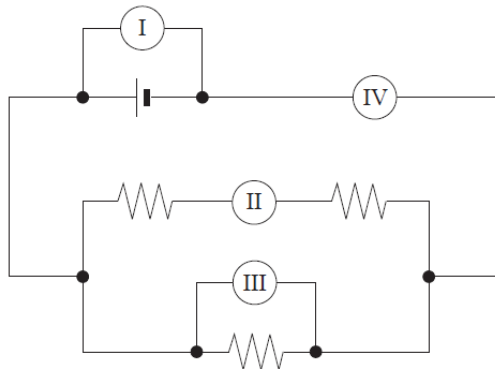


8. A 12V power supply is connected to an  $8.0\Omega$  resistor for 50s. How much charge passes through the resistor?
9. The cell shown delivers a 1.50A current to the external circuit and has a terminal voltage of 2.70V.



- A) What is the emf of the cell?
- B) The  $1.80\Omega$  external resistance is replaced by other resistors and the current and terminal voltage are measured in each case. Using principles of physics, explain the relationship between terminal voltage  $V_T$  and current  $I$  as these resistors are changed?

10. The circuit shown below includes two ammeters and two voltmeters. Identify the correct placement of these meters.

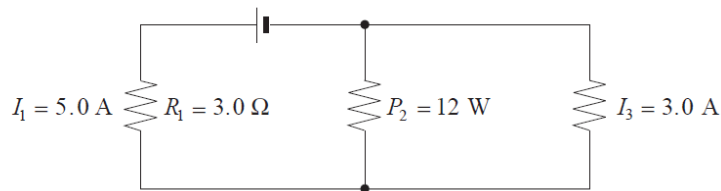


	AMMETERS	VOLTMETERS
A.	I, II	III, IV
B.	I, III	II, IV
C.	II, IV	I, III
D.	III, IV	I, II

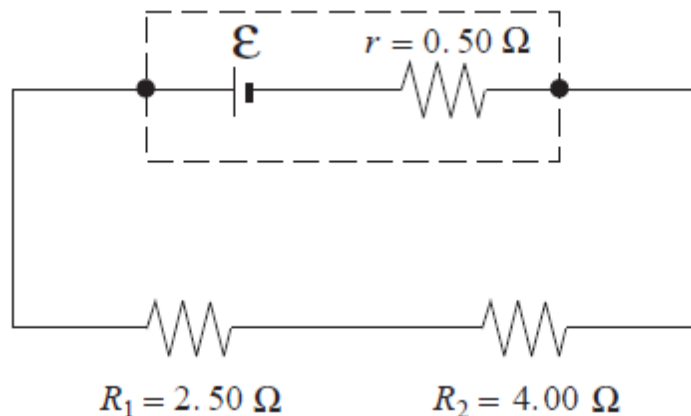
11.

A 120V supply is connected to a heater of resistance  $15\Omega$ . What must the resistance of another heater be in order to produce the same power output when connected to a 240V supply?

12. What is the voltage of the power supply shown in the diagram?



13. The cell shown in the diagram supplies a 1.80A current to the resistors  $R_1$  and  $R_2$ .

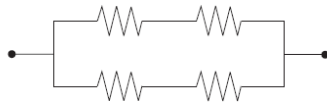


A) What is the terminal voltage of the cell?

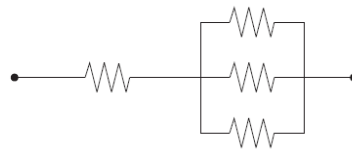
B) What is the emf of the cell?

14. Which of the following arrangements would draw the largest current when connected to the same potential difference? All resistors have the same value

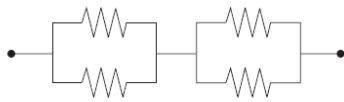
A.



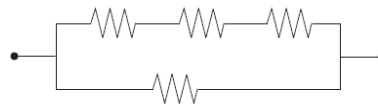
B.



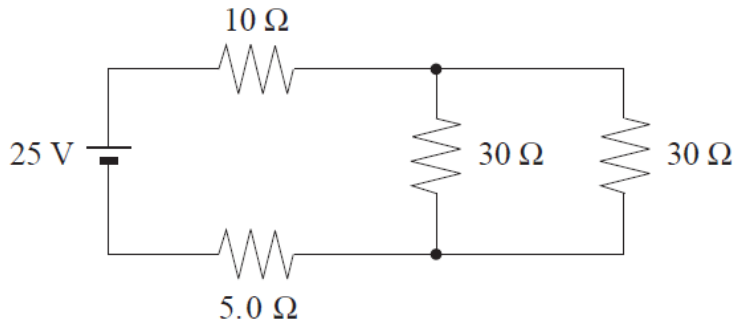
C.



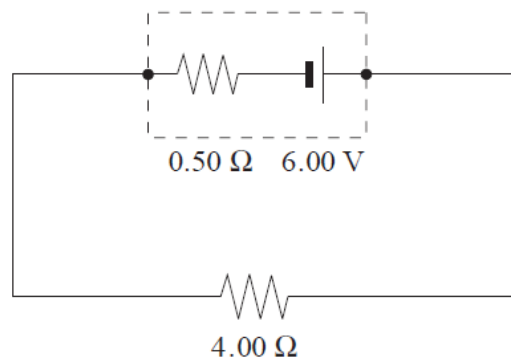
D.



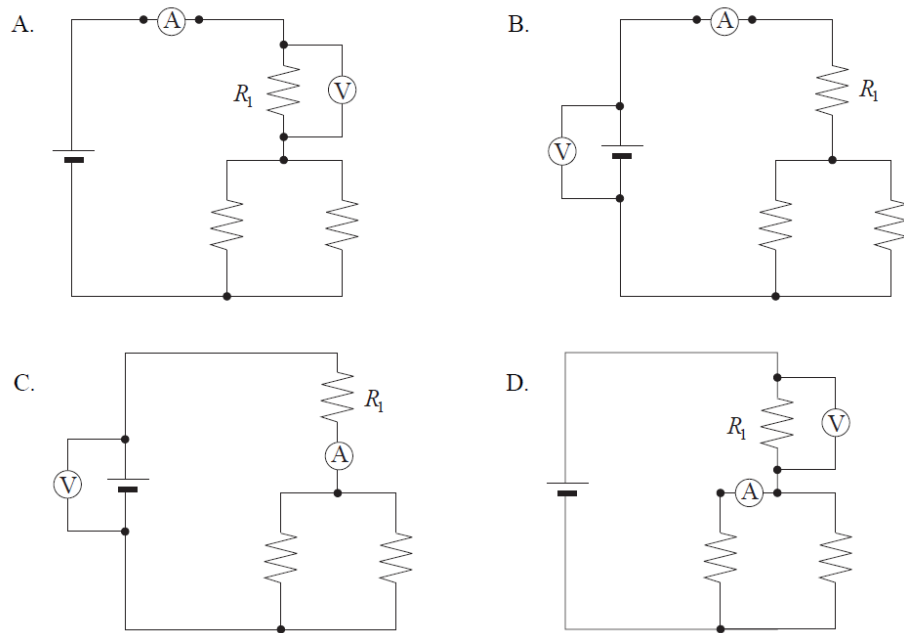
15. What is the power dissipated by the  $5.0\Omega$  resistor in the following circuit?



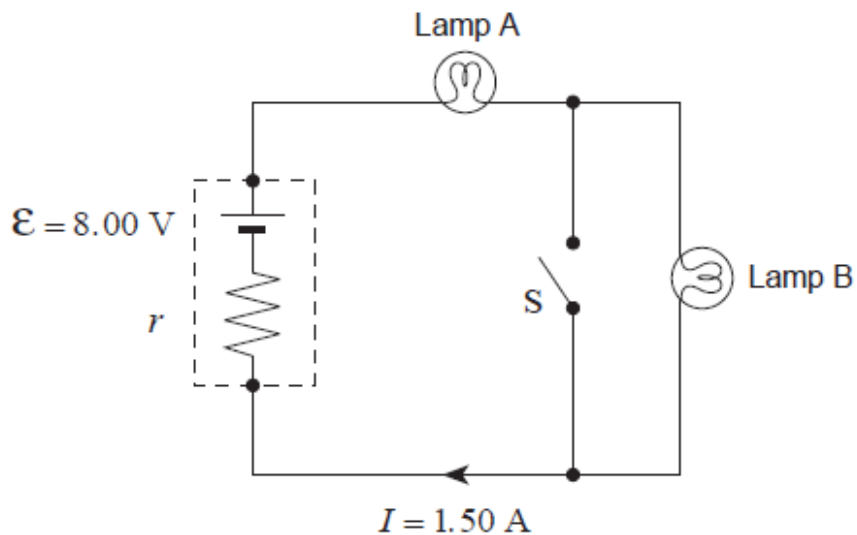
16. What is the terminal voltage of the battery in the circuit shown?



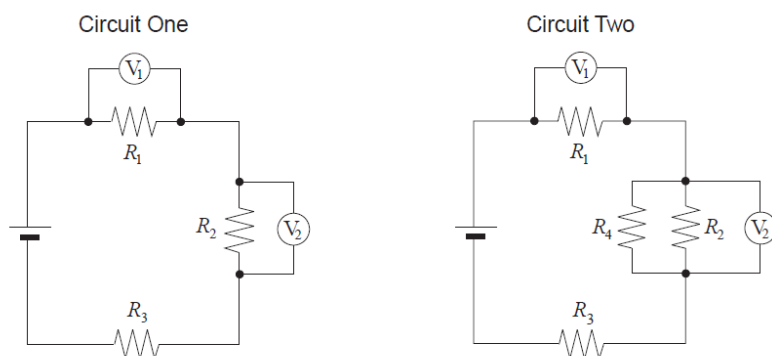
17. Which one of the following shows the correct placement of an ammeter and a voltmeter to determine the power output of resistor  $R_1$ ?



18. The circuit shown consists of an 8.00V battery and two light bulbs. Each light bulb dissipates 5.0W. Assume that the light bulbs have a constant resistance. Switch S is open. If current of 1.50A flows in the circuit what is the internal resistance  $r$  of the battery?



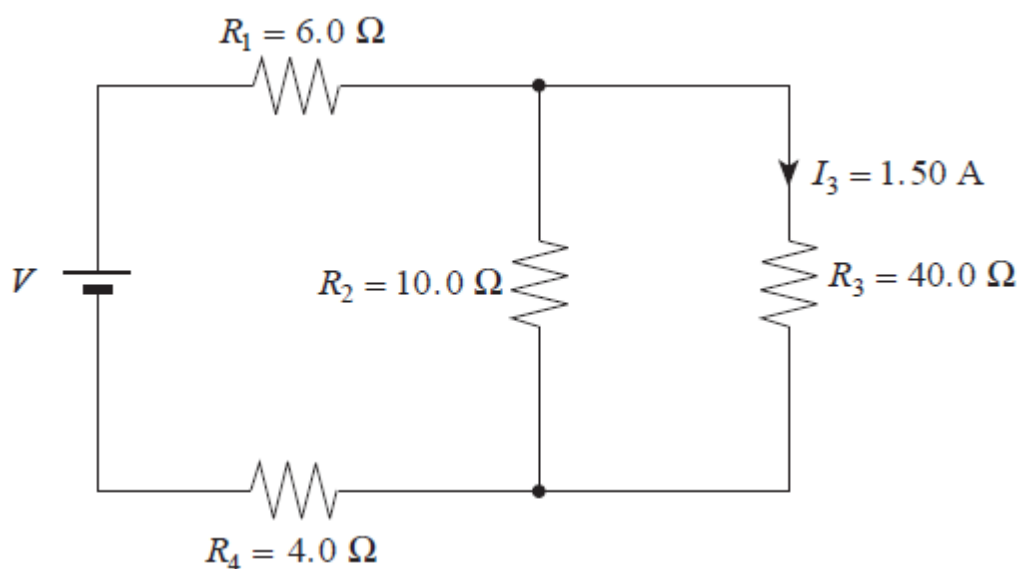
19. In circuit one, resistors and the voltmeters are connected as shown. In circuit two, an additional resistor  $R_4$  is placed in parallel with resistor  $R_2$



How have the values of  $V_1$  and  $V_2$  in circuit two changed compared to those in circuit one?

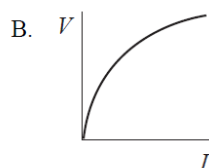
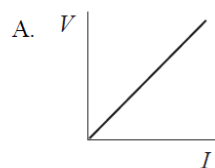
	$V_1$	$V_2$
A.	no change	decreased
B.	decreased	increased
C.	increased	decreased
D.	increased	no change

20. A current of  $1.50\text{ A}$  flows through the  $40.0\Omega$  resistor.



What is the potential difference of the power supply?

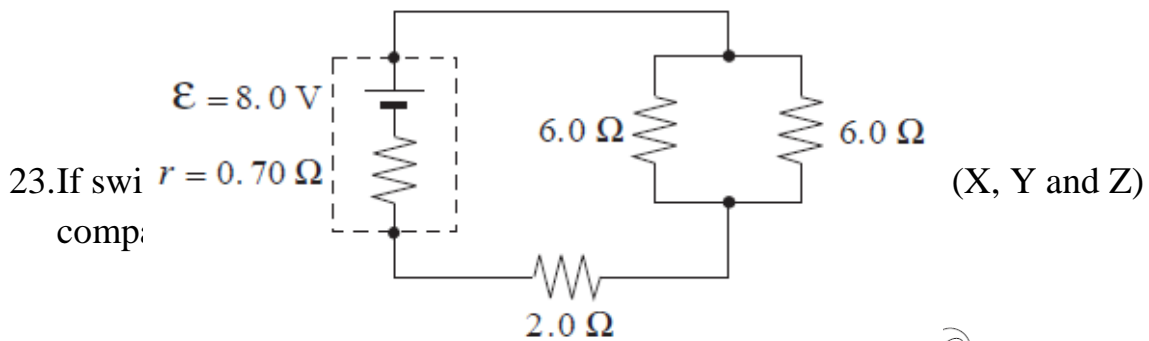
21. Which of the following graphs illustrate Ohm's law?



C.

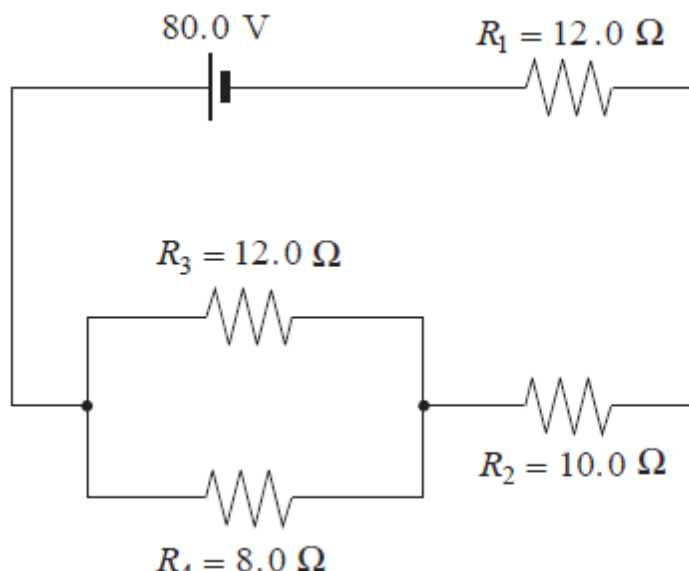
D.

22. In the following circuit, what is the terminal voltage of the battery?



	BULB X	BULB Y	BULB Z
A.	same	same	same
B.	same	dimmer	brighter
C.	same	brighter	dimmer
D.	dimmer	dimmer	dimmer

24. What is the power dissipated in the  $8.0\Omega$  resistor in the circuit as shown?



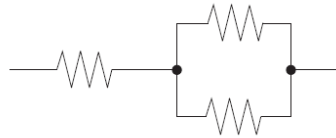


25. Which of the following combination of three identical resistors has the least equivalent resistance?

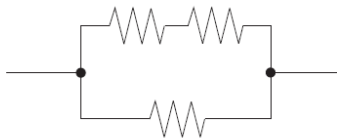
A.



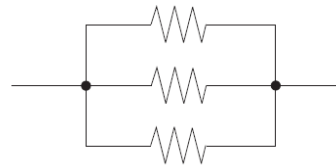
B.



C.

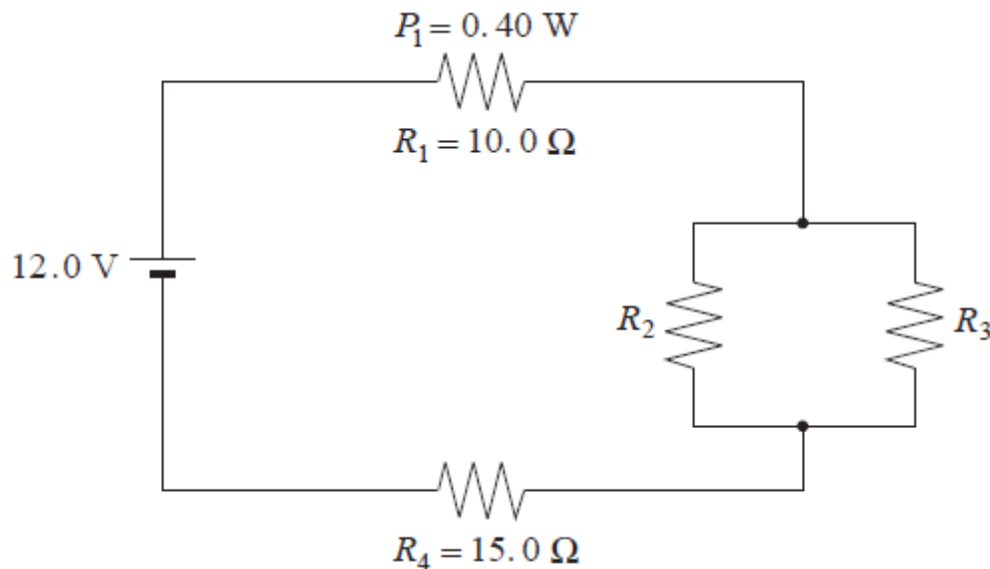


D.



26. An electrical device with a constant resistance draws 0.75A when connected to a 4.8V source. What are the current and power for this device when it is connected to a 6.0V source?

27. In the circuit below, resistor  $R_1$  dissipates 0.40W. Resistors  $R_2$  and  $R_3$  are identical.



What is the resistance of  $R_2$ ?